

## ORNAMENTAL TUBE FOR DECORATIVE LAMP ASSEMBLY

### BACKGROUND AND SUMMARY OF THE INVENTION

5           The present invention relates to a decorative lamp assembly and more particularly, to such a decorative lamp assembly, which causes colored tiny plastic balls to move up and down with bubbles in an enclosed ornamental tube when turned on to emit light.

10           Figures 1~3 show a decorative lamp assembly 9 according to the prior art. This structure of decorative lamp assembly 9 is comprised of an adapter 91, a bulb 911, a lampshade 92, and an ornamental tube 93. The adapter 91 has a socket side adapted to receive the bulb 911, and a plug side adapted to receive power supply from an electric outlet. The  
15 lampshade 92 is comprised of an upper shell 921 and a bottom shell 922. The ornamental tube 93 is an enclosed tube of glass material, having a porous bottom stuffing layer 931 formed of sodium silicate ( $\text{NaSiO}_2$ ) and silica ( $\text{SiO}_2$ ), and an upper stuffing material of dichloromethane ( $\text{CH}_2\text{Cl}_2$ ) 90. During fabrication of the ornamental tube 93, sodium silicate ( $\text{NaSiO}_2$ )  
20 and silica ( $\text{SiO}_2$ ) are put in the tube and heated to about  $30^\circ\sim 35^\circ\text{C}$ . When cooled down, sodium silicate is condensed and bonded to the inside wall of the tube. After formation of the porous bottom stuffing layer 931, dichloromethane 90 is put in the tube with a space left above dichloromethane 90, and then the tube is sealed after exhaust of inside air.  
25 The lampshade 92 is fastened to the adapter 91 around the bulb 911. The

ornamental tube **93** is fastened to the top side of the upper shell **921** of the lampshade **92**, keeping the bottom end suspended above the bulb **911**. When turned on the bulb **911**, heat energy is transmitted from the bulb **911** through the porous bottom stuffing layer **931** to the upper stuffing material  
5 of dichloromethane **90** to boil dichloromethane **92** into bubbles **900**. At the same time, light rays pass from the bulb **911** through the porous bottom stuffing layer **931** and the bubbles **900**, producing a lighting effect.

The ornamental tube **93** of the aforesaid decorative lamp  
10 assembly has drawbacks as follows:

1. Because the ornamental tube is made of glass, it tends to break, and the broken chips of the glass material may injure a person accidentally.
- 15 2. It takes much time to have heat energy be transmitted from the bulb **911** through the porous bottom stuffing layer **931** to the upper stuffing material of dichloromethane **90** to boil dichloromethane **92** into bubbles **900**.
- 20 3. It is difficult to control the quality of the porous bottom stuffing layer **931** by using sodium silicate ( $\text{NaSiO}_2$ ) and silica ( $\text{SiO}_2$ ) to make the porous bottom stuffing layer **931**. If the pores of the porous bottom stuffing layer **931** are not well controlled, convection of bubbles become unstable.

Therefore, it is desirable to provide an ornamental tube for decorative lamp assembly that eliminates the aforesaid drawbacks.

The present invention has been accomplished under the  
5 circumstances in view. It is therefore one object of the present invention to provide an ornamental tube for use in a decorative lamp assembly to produce a convection of bubbles, which is safe in use. It is another object of the present invention to provide an ornamental tube for use in a decorative lamp assembly to produce a convection of bubbles, which  
10 greatly shortens the heating time to heat the filled organic solvent to the boiling status. It is still another object of the present invention to provide an ornamental tube for use in a decorative lamp assembly, which produces a stable convection of bubbles quickly after the lamp bulb has been turned on. To achieve these and other objects of the present invention, the  
15 ornamental tube fastened to the lampshade of a lamp and holding an organic solvent for heating into a boiling status by heat energy from a lamp bulb in the lampshade to produce a convection of bubbles below an inside space thereof, the ornamental tube comprising a plastic tube body holding the organic solvent and defining the space above the organic  
20 solvent, the plastic tube body admitting light and having an open bottom side, a plastic bottom cap capped on the open bottom side of the plastic tube body, the plastic bottom cap admitting light, a spacer member mounted inside the plastic bottom cap and sealed to the bottom open side of the tube body, the plastic bottom cap having a plurality of through holes  
25 through top and bottom sides thereof for guiding the organic solvent from

the tube body to the inside of the plastic bottom cap for heating by heat from the lamp bulb, and a porous cushion mounted in between the plastic bottom cap and the spacer member and adapted to absorb the organic solvent for heating by heat energy from the lamp bulb.

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### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is an exploded view of a decorative lamp assembly according to the prior art.

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Figure 2 is a plain view of the decorative lamp assembly according to the prior art.

Figure. 3 is an elevational view of the decorative lamp assembly constructed according to the prior art.

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Figure 4 is an exploded view of an ornamental tube for decorative lamp assembly according to the present invention.

Figure 5 is an assembly view of the ornamental tube shown in Figure 4.

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Figure. 6 is an exploded view in section in an enlarged scale of the ornamental tube shown in Figure 4.

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Figure 7 is an assembly view of Figure 6.

Figure 8 is an exploded view of a decorative lamp assembly constructed according to the present invention.

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Figure 9 is an elevational assembly view of the decorative lamp assembly shown in Figure 8.

Figure 10 is a plain view showing an operation status of the decorative lamp assembly of Figure 9.

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Figure 11 is an elevational view of an alternate form of the decorative lamp assembly constructed according to the present invention.

## 15 **DETAILED DESCRIPTION OF THE INVENTION**

Referring to Figures 4~10, a decorative lamp assembly in accordance with the present invention is shown comprised of an ornamental tube 1 and a lamp 2. The ornamental tube 1 is stuffed with a stuffing material formed of organic solvent of low boiling point, for example, dichloromethane ( $\text{CH}_2\text{Cl}_2$ ) 18 and properly sealed, having a space 10 in the top side above the dichloromethane ( $\text{CH}_2\text{Cl}_2$ ) 18, and tiny pores 121 in the bottom side. The lamp 2 is comprised of an adapter 24, a bulb 21, a lampshade formed of an upper shell 22 and a bottom shell 23. The upper shell 22 has a top hole 221, which receives the bottom side of the

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ornamental tube 1. When turned on the bulb 21, heat energy is transmitted from the bulb 21 through the pores 121 in the bottom side of the ornamental tube 1 to dichloromethane 18 to boil dichloromethane 18, thereby causing a convection of bubbles 17 in the ornamental tube 1. At  
5 the same time, light rays pass from the bulb 21 through the bubbles 17, producing a lighting effect.

The main features of the present invention are outlined hereinafter. The ornamental tube 1 is molded from plastics and admits light, having  
10 the bottom side capped with a plastic bottom cap 11, and the top side provided with a filling hole 15, which is sealed with a plug 16 after filling of the dichloromethane 18 in the ornamental tube 1. The plastic bottom cap 11 admits light, and is internally mounted with a cushion 12 and a spacer member 13. The spacer member 13 is molded from plastics,  
15 having a plurality of through holes 131 and 132 through the top and bottom sides. The cushion 12 is a porous member made of a foamed material, for example, sponge, having pores 121 in it. Dichloromethane 18 passes through the through holes 131 and 132 of the spacer member 13 to the pores 121 in the cushion 12 where dichloromethane 18 is quickly  
20 boiled by heat from the bulb 21, thereby a convection of bubbles 17 to be produced in the ornamental tube 1. The through holes 131 and 132 stabilize the formation of the convection of bubbles 17.

The ornamental tube 1 has an annular mounting groove 14 in the  
25 bottom side of the body thereof (see Figure 6). The plastic bottom cap 11

has a mounting flange **111** press-fitted into the annular mounting groove **14** of the ornamental tube **1**. After engagement of the mounting flange **111** into the annular mounting groove **14**, the plastic bottom cap **11** is sealed to the ornamental tube **1** by an ultrasonic heat-sealing apparatus. The plastic  
5 bottom cap **11** further comprises a center mounting rod **112** axially forwardly suspended on the inside and inserted into the axial center hole **122** of the cushion **12** to hold the cushion **12** in place, and an inside annular groove **113**, which accommodates the bottom side **130** of the spacer member **13**.

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Figure 11 shows an alternate form of the decorative lamp assembly according to the present invention.

As indicated above, the invention has the following advantages:

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1. Because the ornamental tube **1**, the spacer member **13** and the bottom cap **11** are respectively molded from plastics, the decorative lamp assembly is safe in use.

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2. The spacer member **13** enables dichloromethane to pass to the cushion **12** and then to be quickly boiled into bubbles quickly.

3. The through holes of the spacer member **13** guide dichloromethane to pass to the cushion **12** for boiling and produced  
25 bubbles to pass from the cushion **12** toward the space **10**, therefore a stable

convection of bubbles **17** is quickly produced when turned on the bulb **21**.

Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and  
5 enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.